

REMARKS

Reconsideration of the above-identified application in view of the amendments above and the remarks below is respectfully requested.

Claims 1, 2, 4-12 and 14-23 are currently pending before the Examiner.

Initially, applicants have enclosed terminal disclaimers to obviate the double patenting rejections over claims 1-30 of US Patent No. 6,585,820, in view of Song, 6,010,596; claims 1-32 of copending Application No. 10/525,912, in view of Song, 6,010,596; claims 1-27 of copending Application No. 10/528,471, in view of Song, 6,010,596 and Luongo, 6,251,979 and claims 1-40 of copending Application No. 10/541,804 in view of Luongo, 6,251,979. Reconsideration of this rejection is respectfully requested.

Claims 1, 2, 4-12 and 14-23 stand rejected under 35 USC § 103(a) and as being unpatentable over Imai, US 5,120,355, in view of Luongo, US 6,251,979. The rejection is respectfully traversed.

Applicants' presently claimed invention, is directed towards an emulsion for gypsum products, which comprises a wax, an alkyl phenol, a polynaphthalenesulfonic acid, an alkali metal hydroxide, water and a complexed starch, wherein the alkyl phenol is a C₂₄-C₃₄ methylene coupled alkyl phenol. Benefits of such an emulsion include gypsum products with less degradation of the pH due to bacteriological activity, no decomposition of sodium lignasulfate in long-term storage, less viscosity changes with temperature and age, and increased predictable use rate at the mixer.

Imai, unlike applicants' claimed invention, does not teach the use of a C₂₄-C₃₄ methylene coupled alkyl phenol. Imai only teaches a hydrocarbon resin which may or may not contain phenol, wherein the only phenols taught or suggested are phenol, catechol, resorcinol and hydroquinone (column 3, lines 54-63).

To provide a beneficial water resistant property, in the present invention, the wax crystals need to be aligned and able to coat the gypsum products. The combination and reaction of applicants' C₂₄-C₃₄ methylene coupled alkyl phenol and the polynaphthalenesulfonic acid, acts to modify the wax crystal and allows the wax crystals to resist plating and linking with themselves and instead remain in a disassociated state until they are transferred due to polarity to the gypsum. These modified wax crystals are then able to align and coat the gypsum products, providing applicants advantageous water resistant property. Imai does not teach the use of a C₂₄-C₃₄ methylene coupled alkyl phenol, the combination of C₂₄-C₃₄ methylene coupled alkyl phenol with a polynaphthalenesulfonic acid or the resultant improved water resistant property achieved from this novel combination.

Luongo does not resolve the deficiencies of Imai. Luongo teaches a wallboard composition comprising a combination of synthetic binders with an expanded mineral (e.g. Perlite) that reduces the amount of gypsum used. Imai's overall result is described as a "complete crosslinking between the starch, borate, and synthetic adhesive to form a strengthened web for gripping the Perlite..." (column 12, lines 35-41). The combination of Imai, in view of the teachings of Luongo, would at best suggest lightening the gypsum board, by reducing the amount of gypsum used.

Applicants use of a complexing starch distinguishes itself from Luongo, in addition to being unique from previous uses of starch in gypsum. Previously, the use of starch in gypsum was only used as an adhesive on the outer surface to attach the paper. The present invention not only uses the complexing starch on the inside of the gypsum but additionally uses the complexing starch to complex the impurities inside the gypsum board.

As described in Luongo, starch and borate can be combined to form a binder to give a wallboard strength but traditionally gypsum compositions rather rely on the gypsum crystal growth brought about by the heat treatment of the wallboard in its final manufacturing stage. "Thus, traditional gypsum wallboard compositions do not rely on the adhesive nature of the

combination of starch and borate" (Column 12, lines 59-61). If starch were to be used in a gypsum board it would only be used on the outside of the gypsum to attach the paper.

The present invention utilizes a complexed starch to complex the impurities inside the gypsum board thereby increasing the water resistance of the gypsum board, improve foam support and improve slurry additive compatibility. Reconsideration of this rejection is respectfully requested.

Applicants do not believe that any additional fees are due in the submission of this response. However, if any fees are due, Applicants hereby grant the USPTO to withdraw any fees as required from deposit account number 50-1863.

In light of the above amendments and remarks, it is respectfully submitted that the pending claims of the present application are in condition for allowance. If the Examiner has any questions or requires additional information, he is invited to contact the undersigned.

Respectfully submitted,



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